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10-31-2019

S1E2: Would you feed your dog biscuits that were made with green crabs?

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Repository Citation

Lisnet, Ron; Myracle, Angela; and Skonberg, Denise, "S1E2: Would you feed your dog biscuits that were made with green crabs?" (2019). *The Maine Question*. 4.

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The Maine Question podcast transcript

S1E2: Would you feed your dog biscuits that were made with green crabs?

[Repetitive, pulsing background music]

00:03 Ron Lisnet

Hello and welcome to *The Maine Question*, a podcast series from the University of Maine. I'm your host Ron Lisnet. This episode is another example of how research and developments can take a negative situation and turn it into something more positive. There's been a lot of stories in the news media of late that detail the loss of valuable species in our oceans; cod, and other groundfish, soft shell clams, tuna. At the same time, there's a lot of examples of pests or invasive species whose populations are booming and causing damage or depleting the seafood species that we all like. Well, what if you could find a use for some of those invasive species that are exploding and turn them into a desirable product?

Food scientist at UMaine are attempting to do just that, and if they are successful, it could mean a special treat for a land-based animal none other than man's best friend. Beyond that, it could make for some tasty options on the menu the next time you visit your favorite seafood restaurant.

The species in question, the less than tasty sounding green crab, and it is a voracious little critter that can multiply fast. A single green crab can lay 185 thousand eggs per year. It can also consume up to 40 half inch clams in a single day. One reason why the soft-shell clam harvest in Maine is gone for more than nine million pounds in 2015 to less than a million and a half pounds just two years later.

We have two guests on our show today. We'll let them introduce themselves so you can differentiate their voices and then they'll share with us *The Maine Question* they're trying to answer.

01:43 Angela Myracle

I'm Angela Myracle, assistant professor of human nutrition.

01:46 Denise Skonberg

And I'm Denise Skonberg, an associate professor of food science.

01:50 Angela Myracle

Would my dog eat biscuits made with green crabs?

01:53 Denise Skonberg

Would you eat anything that was made with green crab?

01:59 Ron Lisnet

Welcome, [background music fades] thank you so much for joining us. Interesting topic and we're looking forward to digging into this, so maybe both of you can respond to this. Let's talk about the problem. Let's define the problem. Green crabs. Where do they come from? How did they get here? How big a problem? What kind of damage are they causing?

02:17 Angela Myracle

There a voracious predator and they arrived from Europe sometime in the 1800s. Probably hitched a ride in the ballast of ships. We're not really sure. It was an East Coast problem initially and it has progressed to the West Coast.

02:32 Denise Skonberg

Right, and I just want...we're talking about the U.S. here, but I do want to also emphasize that the invasive green crab is really a global problem because they're here in North America, in East and West Coast, up to Canada. But they've also invaded other parts of the globe and having some of the same problems that we're having here, which is that here the economically important issue is that they are predators on some really important soft shell clam species, just general aquaculture in general, bivalve aquaculture like oysters, clams, stuff like that. And also, they do a lot of damage to eelgrass beds, so they have ecosystem damage as well.

03:15 Angela Myracle

Actually, in 1998 they were actually declared or recognized as an aquatic nuisance species. Um, and they...like Denise said, they, uh, established commercial fisheries and ecosystems they damage and are a nuisance, and they also...not only destroying the...and eating what we're trying...the Fishers...fishermen are trying to harvest, but just actually making life hard for the industry.

03:45 Ron Lisnet

Lobster fishermen are finding them in their traps, that sort of thing.

03:48 Angela Myracle

Yup, yup. They get in there and eat the bait and that decreases their catch and it's just problematic.

03:55 Ron Lisnet

Is it to the point where clammers and lobsterman and fishermen are seeing a dent in their bottom line?

04:02 Denise Skonberg

I don't know. I don't know about lobsterman, but certainly the soft shell clam industry in Maine is taking a big hit over the last 10 years and they...a lot of it is tied to green crab and there's researchers in different parts of UMaine System that are looking into that. How can you exclude the green crab from there—from the clam flats — and looking into ways to prevent that. And looking at what kind of predation actually occurs, but it's very significant with regard to the clam industry, here.

04:28 Angela Myracle

Here, so as far as the, you know, trying to put the damages in a dollar amount, um, a 2008 figure referenced about 22 million [dollars] in damages caused by the green crab to aquaculture, fisheries. You know, all at coastal ecosystems, all of that was combined into that figure.

04:46 Ron Lisnet

And we can presume more than 10 years later, it's probably that or worse.

04:49 Angela Myracle

Yup.

04:50 Ron Lisnet

So. I guess the idea behind what you both are looking at is, how do you turn a negative into a positive? Or make it less negative? Maybe using green crabs in various products or in various ways? The one that sort of caught our eye, Angela, was the use of green crab for dog biscuits, so can you tell us the story of how you came up with that idea?

05:10 Angela Myracle

Sure, I mean the green crab—part of its issue is that it's small, so as far as being used as a human food, it doesn't compare to like the Dungeness crab, to where you can actually get enough meat out of it to make a meal. Um and um, they don't play, so you can't treat them like, um, a soft-shell crab. You can't get them to molt so that they can be used in that way. They...that...there were some experiments done for that and they didn't play the game.

So, trying to utilize the range of sizes and, you know, the crab with the shell was a, um, was a target for one of my students. And I...a...um, the idea came from when my partner adopted a dog from Pennsylvania. I gave a new doggie present to her. It happened to be lobster bites that I just found in the store and I thought, 'Ah, dog coming from Pennsylvania to Maine. Let's go lobster.'

And I looked on the back and the source of the lobster was Iceland. And it's like, really? [*Quiet background laughter from Denise*] I mean, we're Maine. Why aren't these made here? And in discussing with one of my students, trying to figure out, you know—okay, we've got these green crabs; I've got a PhD student working on several different things. This was an undergraduate student that wanted to do something. And I said, well, let's figure out how to use...cook the crab, make crab meal, and use it in something. How about dog treats? 'cause I love dogs. At the time I had several dogs and um, it's like they'll eat just about anything I put in front of 'em and they love the smellier the better.

06:42

A goal for making the green crab treats is... The lobster cookies really smelled. Open the bag and it's like 'Whoo!' knock you down. And we wanted to make the green crab treat... You know, people...the, you know—the humans have to be in this. And we're moving more to a pet-centric world to where pets are children and part of the family and things of that nature. So, we wanted a biscuit that, you know, smelt like it was a crab, but didn't knock you down out of the bag.

So, my student started with using three different flours. We tried wheat, rice, and oat. And then the cooking parameters of the crab, you know, as to how what made the best meal. And then we did some test batches. Took him to our neighborhood dogs and our homes and basically, the dogs wolfed them down. The rife, the rice flour we quickly eliminated because they had to sniff that one, two or three times and decide if they wanted it. It was probably a textural thing. But then, we then, you know, we got more and more questions. We stuck with the wheat flour. We eliminated the oat, too.

07:50 Ron Lisnet

Right, so dogs aren't filling out surveys, but you could definitely tell that they were ahead.

07:54 Angela Myracle

Actually, we did have a very small survey and you know it was human driven but, you know, did the dog sniff it or did they just take it or...I mean...we didn't... It was an informal thing we only had like an n of 10—10 dogs testing it out, but we got an idea that it could be something. And then of course the semester ended in the student moved on so...

08:15 Ron Lisnet

Right.

08:15 Denise Skonberg

My dog liked it.

08:17 Angela Myracle

Oh yeah, Autumn did try them.

08:19 Ron Lisnet

Where could this go? We're not going to see multimillion-dollar Green Crab Dog Biscuit companies, but I mean, what's the ceiling on this? What's the potential?

08:29 Angela Myracle

One of my interest since I've been in Maine is the fact that you know, we have a fairly small population, but in the summer, we expand to like four times our population because of the tourism industry. And being is that pets are now part of the family, someone on vacation is one of going to want to take something from Maine home to their dogs, so why not it, you know, be a green crab dog biscuit?

And you know there are other waste streams coming from even the lobster industry that, you know, there could be a, you know, uh, a Maine based variety of dog biscuit selections that people would take home. Um, I, I think that would be very interesting. It would fuel some cottage industries that would be more seasonal but might help control the invasiveness of the green crab, or at least get their numbers down because there would be, you know, utilized as a resource.

09:21 Ron Lisnet

Denise, you've been working with green crabs for a long time. Can you tell us about some of the approaches you've taken to dealing with this invasive species? Food, food additives, chemical compounds, what? Where else have you looked into with, in regards to this?

09:35 Denise Skonberg

Well, when we started off, we were really interested in looking at it as, a just another typical crab using it just like a crab in the ways that people that would be familiar with. So, the very first thing we did was just to look at the nutritional composition and compare that—of the meat — compared to other crabs. And we found that it was, you know, very nutritious, very similar to the Jonah Crab which is a crab around here that a lot of people are familiar with. So, we started with that.

And then, one of the first things we wanted to do was just to get the meat and use some of the meat in different kinds of dishes. And maybe work with some chefs and people like that to try and utilize some of the meat.

The problem is, as Angela said, they're...since they're so small, you can't pick the crabmeat efficiently like you would from a bigger crab. Normally they're steamed, and then there's people who stand around. They crack and pull the meat out. And they sell that, like pasteurized crabmeat. You can't really do that effectively with green crab. So, we were able to use a technology from the food industry where you put it into a piece of equipment that sort of smashes it up and removes the meat, um, and so the meat at that point has really good nutritional value but in the process it loses some of its good texture that people would like.

So, then you have to figure out a way to use that in different kinds of food—in dishes. And so, we tried that. We had a masters student who was using it as an ingredient in kinds of stuffed foods, like he made an empanada. We were thinking well, could you put it like a stuffing a crab stuffing in raviolis? Things like that.

11:05

So, that was sort of the first thing that we were working on, and that turned out really well. We really like that, but there's only so much even by doing that there's only so much you can do with the meat. So, there's a lot of extra byproduct. As Angela said, there's a lot of extra shell that's produced in that process, so then another thing is to think about what kinds of things...could you do value-added things with the shell? Or by pulling specific compounds out? And that's where we are right now. Actually, Angela and I are working together with our PhD student to look at. Can you extract ingredients that might have some kind of bioactive properties for humans? And so that's kind of where we are right now.

And one of the pro...we're working on looking at some of the proteins that are in the crabmeat and extracting them and seeing if they could have some...I won't say nutritional properties, but more like can they have some anti-diabetic effects? Might they improve heart health? Things like that. So, that's where we are right now with it.

12:06 Ron Lisnet

So, a lot, a lot of potential there, but you just don't know where it's going to go. Is it going to be a health thing or that kind of thing?

12:13 Denise Skonberg

Right, well, the way I envision it is, it will be in a food ingredient. So, it's not like it's gonna be a pill that people pop. That's not what I envisioned. We're not in...neither of us are really interested in that.

12:23 Ron Lisnet

Right.

12:24 Denise Skonberg

I'm really interested in having ingredients in foods that can help benefit the health of the people who consume them. So, it would be some kind of thing in the food. It's not like it would be a pharmaceutical, but maybe something targeted to help promote people's health so they don't get into a disease state. So, that's kind of where we're looking with that.

12:41 Ron Lisnet

This is perhaps part of a bigger push in the seafood industry? I mean, you see in Cape Cod, for instance, there's a consortium that's trying to get chefs to use underutilized species, under-loved fish, like dogfish and skate or even some invasive species like lionfish. Is, uh, does what you're working on sort of have a lot in common with that that bigger trend.

13:05 Angela Myracle

Actually, in the Portland area we have had, there is a green crab support group that has encouraged some chefs to use it. And I've tasted a couple of those. Um, you know there was an egg roll made with the green crab. They deep fried a very, very small one [green crab] where you would eat the whole thing. And there was a like a stuffed wonton, you know fried wontons. They were all very, very good. It is ah, it does have a nice flavor, right? And that was a focus for the dog treat...is just because, you know, the shell is an issue, it still has some nutrition-based properties. The chitin is a fiber and calcium and both of those things are, you know, needed in the dogs diet also. So, to make a, you know a treat but something that also had some nutritional properties.

13:59 Ron Lisnet

Another trend that seems to be out there a lot now is, people are paying more attention to where their food comes from and the environmental impact that farming or catching these foods have, and they're also paying more attention to the nutrients and supplements they get from their food or from vitamins. Is that becoming a bigger emphasis for food scientists such as yourselves?

14:18 Denise Skonberg

Yeah, I'd say the eat local movement in general. That is definitely big and I and I think a lot of people are researching into that. I do want to just sort of follow up on what Angela said about the, sort of on this—it's called the, you know, "Eat the Invasive" movement, and the things she was talking about in Portland. And there's also an Association with that. I just wanted to do a shout out to greencrab.org who—and I happened to bring their cookbook with me—and it is the Green Crab Cookbook and Mary Parks is the person who headed up the Green Crab dot Org and the whole focus of this group is they're trying to work together with researchers like us with maybe some intermediate suppliers, processors, stuff like that, and chefs altogether to try and promote the consumption of green crab.

And so, they're pulling a lot of people together for that, and a huge part of that ties to your question, which is, eating local and trying to make some kind of significant impact on the environment by the choices that we make and what we choose to eat, and so they're really promoting that as part of that. And they made the green crab cookbook. These recipes are delicious. There's some Portland area chefs on board with that and, uh, and with regards to the eating, I'd say the "Eat the Invasive" movement in Portland, in addition to green crab, you see them doing that with those other species you said. So, I

think getting local restaurants on board—maybe higher-end restaurants that are focused on local, that are focused on innovation—getting them on board, making some kind of targeted efforts—and then when they take that step, when the restaurants take the step, then people come to their restaurants and try it out and realize, ‘Hey this is really good. I maybe I can consider consuming products like this.’

16:01 Ron Lisnet

So, the bottom line, whether it's a dog or a person is it has to taste good and this...have you tried the recipes in there, and does it ultimately taste good? I think you said, Angela, you enjoyed it right?

16:12 Angela Myracle

Yeah, I thought it was great. And I think, again, it ties into Maine's tourism industry. If this is something that, you know, again it...tourism is seasonal, but it is there and it is a large part of our economy and it would help these local restaurants and give people something novel to try and they tell their friends and they tell their friends about Maine and eating green crabs and lobster and all that good stuff. And it's something that that I think could be a part of supporting Maine's economy.

16:39 Ron Lisnet

Where could we potentially be with this in 5 to 10 years?

16:43 Denise Skonberg

Well, what I would like to see personally is tiered approaches to using the green crab, where you have lots of different uses, not just one. So, like fishermen can catch the green crab. For them to catch it, it has to have value, right? So, they probably need to get at least a dollar a pound to make it worth their effort. Maybe it won't be a targeted fishery, but while they're out there catching other things they could bring in the green crab and get some value for that.

They need a place to bring that right. Someone who's going to pay them. Let's say a dollar a pound or \$0.75 a pound. And then I see that person, the people buying those green crab, them doing a tiered approach to the utilization of the green crab. To me the best value is, even though Angela said there isn't uh, in the past there wasn't a lot of success with this, now there is a group that is using green crab for the soft-shell industry and they're getting about \$25 a pound for soft-shell green crab. The problem with it is you catch a lot 1,000 pounds of green crab, maybe 50 pounds of that might be able to go into the soft-shell crab, right?

So, a small amount could go into that, but it's extremely high value that can go into restaurants. Now we have all this other mass that's lower value, but then you think about how can that be tiered and how could be that go into different streams. Some of that could go directly into restaurants for use in like crab stock/broth. The kinds of uses that Angela and I saw the chefs to prepare. That could be another stream that would be high value.

And then the lower-value streams would be...it could be processed into some of the meat using the automated system I talked about. That would be another slightly lower value. Then meals could be made, and the meals could go into aquaculture feeds. It could go into pet feeds. And so that way, at the end, and then you know, it's a section. A small amount could be extracted for bio active use which would be really, really, high value. But in terms of weight, it would be a small amount. And by adding up

all of those streams, I think it would allow us to harvest a lot of green crab and to make a total—in terms of total value—there would be some really good, total value out of that resource.

18:56 Ron Lisnet

And just final words from you, Angela. What do you see is the potential future here?

19:00 Angela Myracle

Well, I mean I, I do think that with an approach tiered, as Denise says, we can find ways to boost Maine's economy, and help the local Fishers and give the tourist something new—and the locals—something new to try, and we can help control the invasiveness of this species.

19:20 Ron Lisnet

So, dog biscuits potentially on the, on the shelves in the future? Is that, is that a possibility?

19:25 Angela Myracle

I hope so.

19:26 Ron Lisnet

Alright, well thank you both for joining us. We appreciate it.

19:30 Denise Skonberg

OK, thanks a lot.

19:33 Ron Lisnet

Thanks, once again for joining us. You can find this and all of our podcasts in most of the places that podcasts are available. We'd welcome any feedback you'd care to share on this show or the entire series. Drop us a note at Maine Question at Maine dot edu. This is Ron Lisnet. We'll catch you next time on *The Maine Question*.